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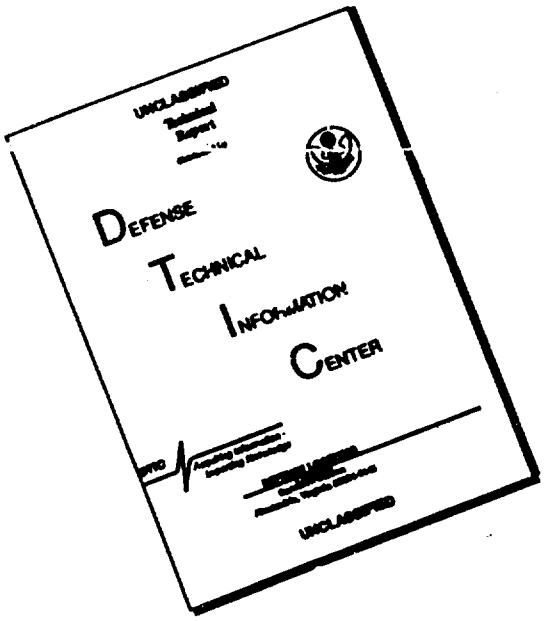

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STUDIES ON THE BACTERIAL LEAF BLIGHT REGION OF RICE PLANT FROM THE VIEWPOINT OF SOIL AND MANURE

I. ON THE OUTLINE OF SOILS

Kyushu Nogyo Kenkyu)Kyushu Agricultural Research), No.15, April 1955. Pages 97-100

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I. INTRODUCTION

Heretofore in the usual locality where wet-land rice leaf blight occurs, flooded areas were considered the normal condition. However, above and beyond this, in Saga prefecture, there were some areas where the usual outbreak occur. Considering this in the category of "Poor Rice Land in the Broad Sense", the authors already classified them as standing water type poor rice fields (1).

In general, with this type of region even the yield of wet-land plants are unstable. Furthermore, the development of the winter crop is not good.

Accordingly, an investigation was made on the characteristics of the wet-land field soils as well as on the development of the wet-land rice plant and submitted as data for later improvements.

II. GENERAL CONDITIONS OF THE AREA

(1) Weather - Topography - Geology - Altitude:

a. Weather: Annual average temperature 16 - 17°, annual precipitation 1700 mm.

b. Topography: Flat land

c. Geological Condition: Fourth geological era new layer of river and ocean-bed alluvial soil

d. Altitude: 4 - 7.5 m

(2) Distribution:

The area is sporadically distributed mostly within the Saga plain at the foot of the mountain close to the strip of level land (Figure 1).

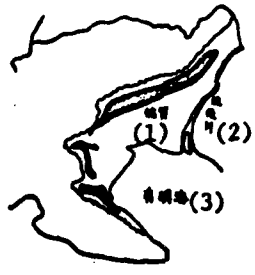

Figure 1. Distribution of Area

1) Saga
2) Chikugo River
3) Ariake Sea

III. SOIL

1. Cross-Sectional Characteristic of Soil

Details of the sectional configuration of the soils will be presented separately, but the characteristic of the soil configuration has been arranged in Table 1. (The soil characteristic map of Figure 2 has been omitted because of space requirement).

These in the category of standing water are divided into I, II, and III and these were compared with a reference field. According to this:

(1) The loam stratum which is primarily based on peat is 40 cm deep more or less. Furthermore, the loam-like stratum is approximately 20 cm deep. Moreover, disregarding the loam "grei" stratum, the recent ash "grei" stratum is quite deep.

(1)区分	No.	(3)場所 (4)	(12)泥炭乃至黒泥層	(19)灰ダイ層	(21)地下水位	(22)土の性	(24)構造の発達 (25)	(32)保水日数	(34)備考
I	35	五町田・五丁田	36～56cm (13)(黒泥化)	56cm (20)以下	65cm	C(CL)	(24)弱	(33)3日	(35)河川成土
	50	(5)牛神・乙神	41～55 (55～90) (黒泥化) 泥炭(14)	90～	62	CL	(25)微弱	5	河(36)成
	11	(6)三日月・佐賀南	41～70 (黒泥化)(15)	70～	60	C(CL)	弱(26)	6	河(37)成
	48	(7)西郷・城民	42～80 (黒泥化)(16)	80～	60	C(CL)	弱(27)	5	(38)河川成
II	61	(8)兵庫・御示野	16～26 (黒泥類似層)(17)	95～	53	CL'(C)	弱(28)	5	(39)河川成
	65	(9)上峰・中村	25～80 (黒泥類似層)(18)	～	55	L'	(29)微弱	6	河(41)成
III	49	(10)鹿島・世間	—	35～	35	CL	極(30)弱	7	河川成(41)
(2)対照	25	佐賀・神野 (11)(元農試)	—	95～	85	CL	中(31)庸	3～4	河川成(42)

(43) 註：ここに黒泥類似層と仮称するものは，黒ぼくに由来するものとみられる黒色泥土層を意味する．

Table 1. Characteristics of the Soil Configuration

1) Subdivision
2) Control·
3) Location
4) Gochoda-Gotoda
5) Ushizu-Otsuryu
6) Mikkazuki-Sahatanami
7) Nishizato-Yokodake
8) Hyogo-Wakijino
9) Jomine-Nakamura
10) Kashima-Seken
11) Saga-Kamiya(former Agriculture Sta.)
12) Peat to Loam Strata
13) (Loam Forming)
14) (" ") Peat
15) (" ")
16) (" ")
17) (Loam-like Stratum)
18) (" " ")
19) Recent Ash "Grei" Stratum
20) Less than 56 cm
21) Ground water Level
22) Underground Water Level
23) Development of Structure
24) Weak
25) Slightly Weal
26) Weak
27) "
28) "
29) Slightly Weak
30) Very minute
31) Intermediate
32) Period of Water Retention
33) Days
34) Note
35) River-Sea Soil
36) River Formed
37) " "
38) River-Sea Soil
39) " " "
40) River Formed
41) River-Sea Soil
42) " " "
43) Note: That which is referred to as Loam-like, is the dark colored soil stratum.

(2) In the lower strata, the recent ash-grey layer appears more often. Moreover, the underground water is high, in general, attaining 50 - 60 cm in most places.

(3) The soil characteristic of the present area is mostly viscous. Moreover, the development of the plowed bed and structure is weak, the period of water retention is quite long and the water permeation is generally poor.

2. Physical Characteristic

(1) Mechanical Constitution - According to Table 2, all the dirt fractions contained large amounts of minute and fine sand; however, there are those which were more uniform. Accordingly, with regard to the mechanical constitution, it is rather difficult to note distinct characteristics.

(1) 区分	No.	層(2) 位	(3) ピペット法による % 細(4) 砂	細(5) 砂	微(6) 砂	粘(7) 土	(8) 土性
I	35	I (A)	13.46	18.24	44.23	24.07	Clay loam
		II (B)	6.71	16.34	45.89	31.06	Silty Clay
		III (GPm)	6.33	16.34	54.90	22.43	Cilty Clay loam
		IV (G)	2.76	15.26	58.44	23.54	〃
	50	I (A)	11.59	46.39	25.60	16.43	Clay loam
		II (B_1)	14.15	44.89	31.55	9.41	Loam
		III (B_2)	24.62	45.08	21.92	8.38	Sandy loam
		IV (GM)	1.23	28.31	42.23	28.23	Light Clay
II	29	I (A_1)	0.94	9.25	58.09	31.72	Silty Clay
		II (A_2)	1.11	11.75	59.74	27.40	〃
		III (Bm)	0.46	14.86	56.02	28.66	〃
		IV (BG_1)	0.45	9.88	58.52	31.15	〃
III	49	I (A_1)	0.85	25.49	55.92	17.74	Silty Clay loam
		II (A_2)	1.40	15.55	55.91	27.14	Silty Clay
(9) 対照	28	A_1	18.49	12.46	47.06	21.99	Silty Clay loam
		A_2	—	—	—	—	
		B_1	12.76	31.73	31.66	23.88	Clay loam
		B_2	4.41	7.80	52.03	35.73	Silty Clay

Table 2. Mechanical Structure of Soil

1) Subdivision
2) Strata
3) % by Pipette Method
4) Coarse Sand
5) Fine Sand
6) Ultra-fine Sand
7) Clay
8) Soil Type
9) Control Field

Table 4. Chemical Analysis of Soil

(1) 区分	No.	(2) 層位	(3) 全窒素%	(4) 腐植%	pH (H_2O)	(5) 置換石灰%	(6) 遊離鉄%	(7) NH_4 化成率
I	35 (8) (五丁園)	A	0.195	4.23	5.6	0.45	1.19	7.8
		B	0.190	2.39	7.0	0.50	1.30	—
		GPm	0.293	6.03	6.3	0.55	—	8.1
		G	0.163	3.89	6.1	0.53	—	—
	50 (9) (牛 神)	A	0.185	2.58	5.3	0.19	1.93	11.3
		B_1	0.069	1.49	6.4	0.22	1.43	—
		B_2	0.057	1.35	6.7	0.18	—	—
		Gm	0.332	8.94	6.4	0.38	—	4.3
	11 (10) (三日月)	A	0.222	3.49	6.8	0.21	2.37	(11)欠
		B_1	0.257	5.88	7.0	0.18	2.68	—
		B_2	0.263	7.51	6.3	0.26	—	—
		Gm	0.303	9.17	6.5	0.43	—	2.5
	48 (12) (西 郷)	A	0.206	3.51	5.9	0.30	1.00	8.2
		B_1	0.077	1.37	6.3	0.34	0.95	—
		B_2	0.095	2.03	6.6	0.35	—	—
		GPm	0.237	7.85	6.8	0.31	—	2.7
II	61 (13) (兵 庫)	A_1	0.255	5.75	5.1	0.49	1.08	4.7
		A_2	0.213	7.02	6.0	0.53	1.11	—
		Bm	0.360	13.31	5.7	0.51	—	2.4
		G_1	0.087	1.63	4.5	0.18	—	—
	65 (14) (上 峰)	A_1	0.409	5.49	4.9	0.27	1.40	6.8
		B	0.174	1.53	6.5	0.27	0.96	—
		Gm	0.373	9.83	6.1	0.39	—	5.0
	29 (15) (兵 庫)	A_1	0.249	5.57	4.9	0.38	1.03	4.1
		A_2	0.183	4.79	5.7	0.49	1.26	—
		B_1	0.092	3.49	5.8	0.35	—	—
III	49 (16) (島 島)	A_1	0.273	4.29	6.1	0.46	1.58	8.5
		A_2	0.255	3.96	6.4	0.49	1.47	8.0
対照園 (17)	25 (18) (佐 賀)	A_1	0.258	4.22	5.6	0.29	1.34	—
		A_2	0.198	3.17	6.0	0.36	1.10	—
		B_1	0.124	1.01	7.0	0.40	1.46	—
		B_2	0.089	1.23	7.2	0.55	—	—

1) Subdivision
2) Strata
3) Total Nitrogen %
4) Humus %
5) Lime Replaced %
6) Metallic Iron %
7) NH_4 Transformation Index
8) (Gotoda)
9) (Ushizu)
10) (Mikkazuki)
11) Absent
12) (Nishizato)
13) (Hyogo)
14) (Jomine)
15) (Hyogo)
16) (Kashima)
17) Reference Field
18) (Saga)

layer was generally high. For example, it compares with the NH_3-transformation rate in rice fields with standing water at such places as Shioire and Aomine [2].

Although the chemical analysis was not complete, the results of determining the Eh (Acid reduction potential) of a portion of ground were as follows (Harvest soils during the first part of August):

No. 50-I indicated Eh 17.5 mv, No. 25-I (Reference) Eh 188 mv. Thus the Eh of the soil of the present area was extremely low compared to that of the reference.

Although a summary of the ground environment of the typical wet-land, where wet rice plant leaf blight outbreak occurred at Saga prefecture, has been presented above; it is hoped that future investigations can be made on the effect of soil dehydration, the texture of the humus, the relationship of potassium, nitrogen and of other inorganic components. Furthermore, using the investigation on cultivation as a basis, it is hoped that research can be conducted on the period of development and the permeation of nourishment for the wet rice plant.

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(2) S. Aomine: Effect of Culvert Drainage and Dehydration, p. 26 (1949).